Pollution Prevention Activities: Burn Barrels, Pharmaceuticals, and E-waste

Elizabeth Hinchey Malloy, IL/IN Sea Grant

Erin Newman, U.S. EPA Region 5

Susan E. Boehme, IL/IN Sea Grant

Great Lakes Binational Toxics Strategy Meeting

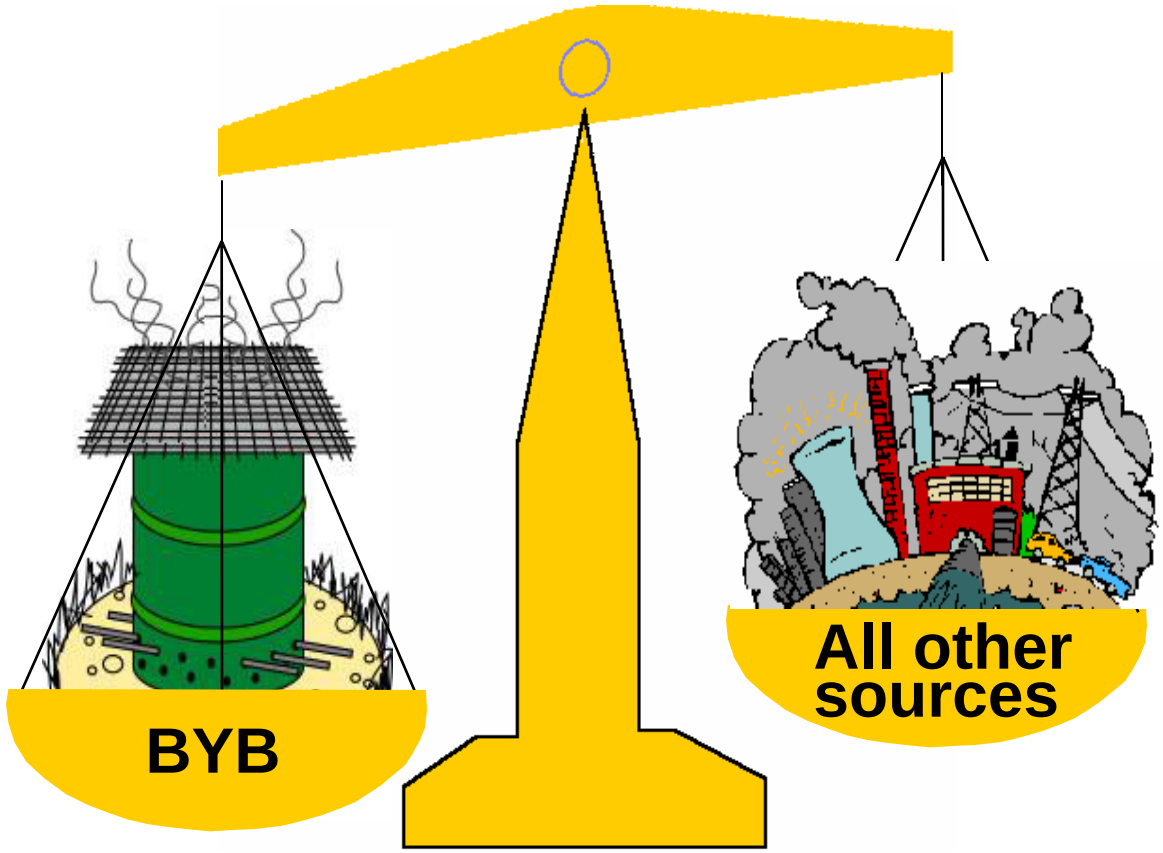
September 19, 2006

Burn Barrels

Why is Backyard Burning a Priority?

- BYB is the largest remaining quantified source of dioxin emissions.
- BYB used by an estimated 20 million Americans.
- Proximity to animal feed and food crop production increases concern.
- Reducing BYB also reduces other toxic releases including metals, PAHs, and particulate matter.
- Reducing BYB will reduce accidental fires.

BYB Emissions are Greater Than All Other Quantified Sources of Dioxin



The BYB concern is not just about releases, but also exposure...

Most BYB occurs in rural areas where emissions can readily contribute to contamination of animal feed and grazing lands.

Three Tiered Approach: Education, Infrastructure, and Compliance

- Educate government officials and the general public on the concerns of BYB.
- Provide information on infrastructure and alternatives to BYB in rural areas.
- Strengthen state, tribal, and local ordinances on BYB. Support greater compliance with existing regulations.

What's Inside the Toolkit ?

- Introduction to the issue
- Example Powerpoint presentation
- Western Lake Superior Sanitary District Toolkit
- Case studies of national, regional, and local burn barrel programs
- State highlights section
- Available brochures and outreach materials
- Example ordinances
- Information on infrastructure and waste transfer stations
- Example survey
- Links to additional resources

www.openburning.org

www.epa.gov/msw/backyard


GREAT LAKES INTER-TRIBAL COUNCIL
Ontario
Department of Environmental Quality
THE GREAT LAKES BINATIONAL TOXICS STRATEGY
Environment Canada
Environnement Canada
Department of Environmental Protection
CGLI
Council of GREAT LAKES INDUSTRIES
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WISCONSIN DEPT. OF NATURAL RESOURCES
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
New York State Department of Environmental Conservation
Minnesota Office of Environmental Assistance
Lake Michigan Lakewide Management Plan
OhioEPA
Illinois Environmental Protection Agency
United States and Canada
binational.net
Minnesota Pollution Control Agency

Pharmaceuticals and Personal Care Products (PPCPs)

Disposal of Unwanted Pharmaceuticals

- Pharmaceuticals are not entirely consumed due to:
  - Patient's health improves or death
  - Patient non-compliance
  - Change in prescription
  - Medication includes more product than needed
  - Expiration date reached before product consumed (OTC medications)

Expired Medication Disposal Survey

- Survey of 100 pharmacies and 500 patients**
- Pharmacy Policy:
  - **97%** had established policies regarding the disposal of expired, ***UNDISPENSED*** medication
- Pharmacy Advice:
  - Only **5%** had consistent recommendations for patients on PRESCRIBED drug disposal
  - **25%** indicated that the issue of drug disposal was addressed only at the customer's request

** Boehringer, S. "What's the Best Way to Dispose of Medications?" (2004)

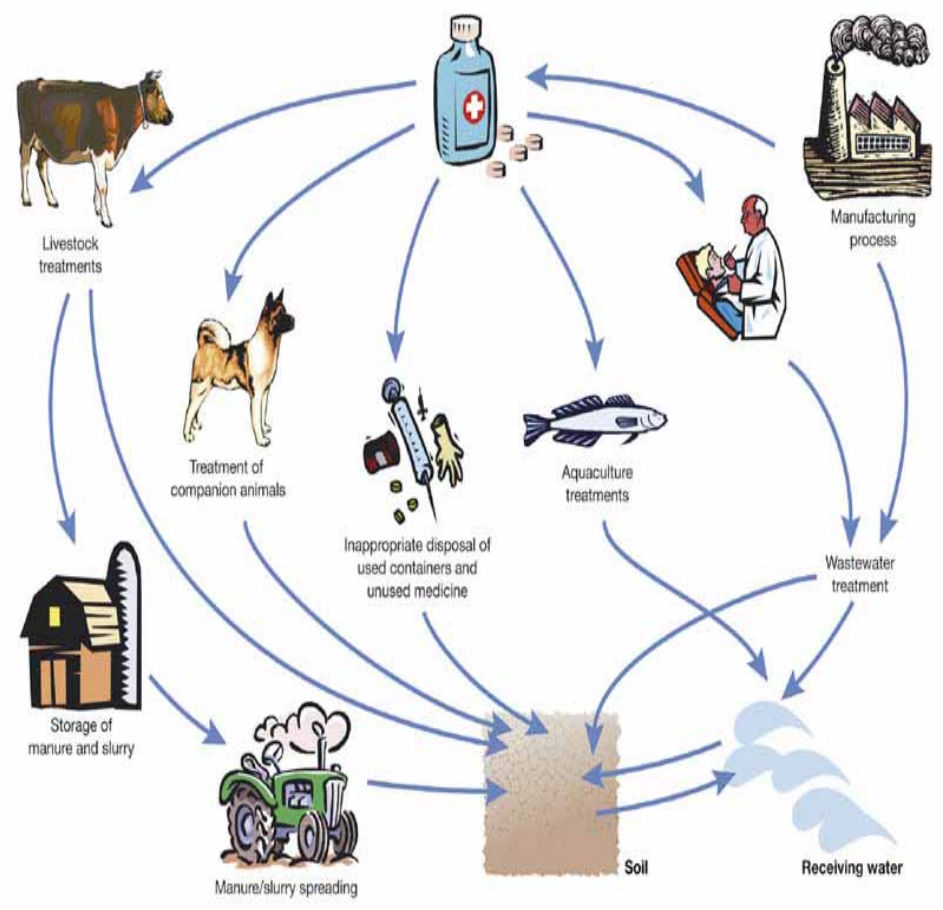
Risks Posed by Improper Pharmaceutical Disposal

- If Flushed
  - Kill beneficial bacteria responsible for breaking down waste in sewage plants and damage septic systems; contaminate water in surrounding environment
- If Shared, Stolen, or Sold
  - Recycling medication is illegal; harmful w/o supervision
- If Placed in Trash
  - Scavenged, illegally sold, poison animals

4 Main Risks of Improper Disposal Practices

- Environmental Impact
  - Accumulation in waterways → potentially harmful effects on wildlife and humans
- Accidental ingestion (children & elderly)
  - 78,000 children/year under 5 treated for unintentional medication poisoning in U.S.
- Illegal use or theft
  - Appropriation of pharmaceuticals by family and friends, workers in homes, and burglars
- Unnecessary accumulation & waste of health care $$$
  - Increasing medication use, consumer forgetfulness, dosage confusion, prescription changes, & avoidance of unpleasant side effects

Entry Paths into Environment from Pharmaceuticals

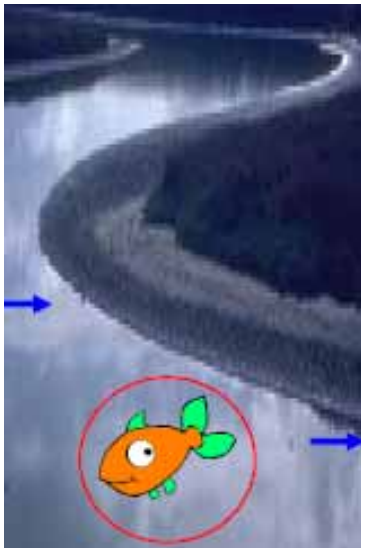


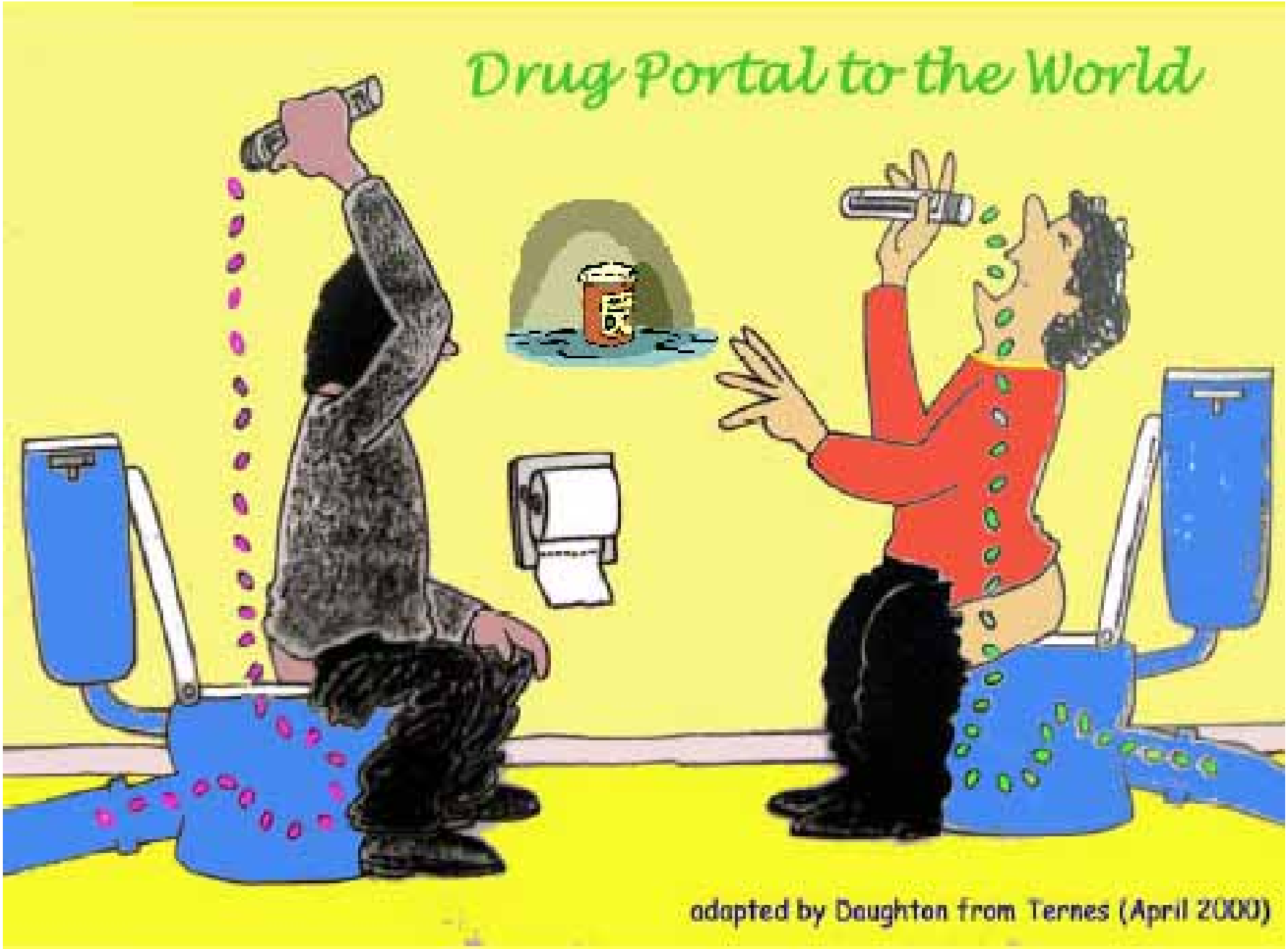
- Plants that treat household, industrial, and business waste water
- Runoff from landfills
- Industrial dischargers
- Commercial animal feeding operations & aquaculture
- Surface application of manure and biosolids

Photo Credit: www.york.ac.uk/.../ gsp/esm/images/pharma1.jpg

Pharmaceuticals and the Environment

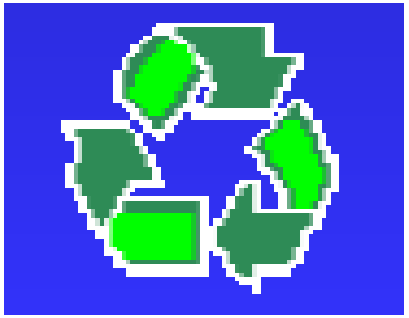
- U.S. Geological Survey (USGS) study-2000
  - Found at least one PPCP contaminant in 80% of 139 streams sampled in 30 states
  - Residential, commercial, and agricultural pharmaceuticals can follow two pathways to environment:
    - Metabolic excretion
    - Direct disposal




Drug Portal to the World
adapted by Daughton from Ternes (April 2000)

Pharmaceutical Waste Management Issues and Barriers

- Disposal methods
- Funding
- Communication
- Convenience
- Lack of Conclusive Research
- Identification of Controlled Substances
- Pharmaceutical-like Items
- Drug Abuse
- Determination of Legal Waste Generator
- Privacy
- Safety



Initiatives in the United States

- Numerous short-term programs & pilots:
  - Programs & Pilots in WA, CA, FL, IN, the Northeast, and Chicago
  - First legislation in Maine—mail-back program
  - Product Stewardship Institute-12 month dialogue-overcome communication barrier between stakeholders
  - Hospitals for a Healthy Environment (H2E)-focus on hazardous & pharmaceutical waste; EPA grant to develop a pharmaceutical waste management blueprint
  - EPA Interagency Task Force Formed
    - Connects to Pollution Prevention (P2) initiative
    - Pharmaceuticals = emerging chemicals of concern

Return Unwanted Medicines

home

International Initiatives

- **Australia**:
  - Community pharmacies collect unwanted/expired medications
  - Paid for by Commonwealth with pharmaceutical industry support
- **Canada-British Columbia:**
  - Return program established voluntarily by pharmaceutical industry
  - 75% of all pharmacies in British Columbia accept unused/expired medications
- **European Union:**
  - 11 nations have take-back programs
  - Pharmacies accept unwanted pharmaceuticals
  - More than ½ operated by pharmaceutical industry/ pharmacies—remainder paid for by municipalities

Toolkit

<u>Resource Kit</u>: Proper Disposal of Pharmaceuticals and Personal Care Products—A Resource for Action in Your Community

- Includes:
  - Background
    - What are PPCPs?
    - What are the risks of improper disposal?
    - How do PPCPs enter the environment?
  - Take-Back Program Case Studies—Models of Success
  - Household Pharmaceutical Waste Management Issues and Barriers
  - Pharmaceutical Donation/Take-Back Legislation
  - Public Education/Outreach Materials

Used Electronics

Toxicity – The First Concern

By Tim Townsend, University of Florida

- Toxic materials have historically been used in electronics
  - Lead
  - Mercury
  - Brominated Flame Retardants (BFR)
- Toxins are used for function and safety
  - Lead prevents x-ray emissions from CRTs and is a component of solder
  - Mercury lamps have been used in LCD displays
  - BFRs increase product fire safety

Volume – The Second Concern

- 40 million computers were obsolete in 2001
- Only about 10% were recycled
- Electronics are a rapidly growing, 3X faster than other parts of the waste stream
- Toxic components can present hazards

Responsible EOL Management Options

- Reuse/donation
  - Within an organization
  - Local Schools
- Recycling
  - Select a recycler based on:
    - Industry certifications held; ISO, International Association of Electronics Recyclers. (EPA does not certify electronics recyclers)
    - Ability to responsibly do the work that is needed
    - Reduce information and environmental liability
  - Remember, the lowest price is not always the best value

Responsible EOL Management Options

- Disposal, can e-waste go into the trash?
  - It depends who you are, and where you are
    - Your generator status
      - Large and small quantity generator
      - CESQG – Conditional Exempt Small Quantity Generator
    - Are state regulations more rigorous than federal? Examples:
      - Michigan - some e-waste is a universal waste
      - Minnesota – CRTs are banned from disposal

E-waste Management Tools

- Final CRT (Cathode Ray Tube) Rule
  - Will provide a conditional exemption from the definition of hazardous waste for CRTs and monitors sent for recycling or reuse
  - The effect will be to streamline the management of CRTs, and should improve recycling
- Selecting your recycler tools
  - Information about how to review a recycler's practices to ensure material is handled as needed, and to reduce potential informational and environmental risk
    - http://www.federalelectronicschallenge.net/resources/eolmngt.htm
- Finding recyclers:
  - Contact state environmental and commerce agencies to see if they offer lists.